

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,005,087 B2
APPLICATION NO. : 10/748725
DATED : February 28, 2006
INVENTOR(S) : Tong

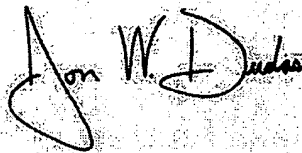
Page 1 of 5

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Delete claims 1-17, and replace with claims 1-17 as attached.
Col 10 - line 28 thru Col 14 line 47

Signed and Sealed this

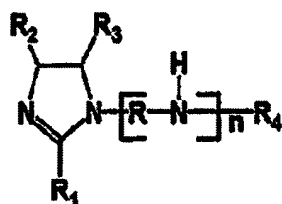
Twenty-seventh Day of February, 2007

A handwritten signature in black ink, appearing to read "Jon W. Dudas", is written over a light, textured background.

JON W. DUDAS
Director of the United States Patent and Trademark Office

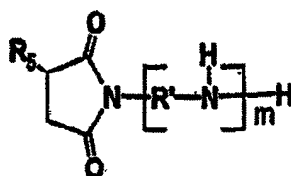
CLAIMS

1. A composition comprising (meth)acrylic acid and one or more of the compounds selected from the group consisting of aminoalkyl imidazolines of formula (I)



(I)

and alkyl-substituted succinimides of formula (II)



(II)

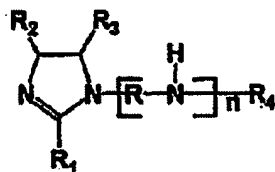
and mixtures thereof wherein n is an integer of 1 to about 9; m is an integer of 1 to about 10; R and R' are C₁-C₆ alkylene; R₁, R₂, R₃ and R₅ are independently selected from C₁-C₃₀ alkyl, alkenyl, aryl, alkylaryl, arylalkyl, aminoalkyl, and aminoaryl; and R₄ is selected from hydrogen, (CH₂)₂COOH, CH₃CH(CH₂)COOH, imidazoline, alkyl and alkylaryl.

2. The composition of claim 1 wherein the aminoalkyl imidazoline is prepared by reacting a carboxylic fatty acid with a polyethylene polyamine.

3. The composition of claim 1 wherein the aminoalkyl imidazoline is prepared by reacting tall oil fatty acid with a polyethylene polyamine.

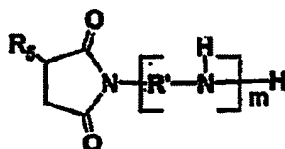
4. The composition of claim 1 wherein the aminoalkyl imidazoline is prepared by (i) reacting tall oil fatty acid with a polyethylene polyamine; and (ii) reacting the product of step (i) with acrylic acid.
5. The composition of claim 1 wherein the alkyl-substituted succinimide is prepared by reacting a mixture of C_{12} - C_{30} olefins, maleic anhydride and polyethylene polyamine.
6. The composition of claim 1 wherein the alkyl-substituted succinimide is prepared by reacting a mixture of C_{12} - C_{30} olefins, maleic anhydride and diethylene triamine.
- 10 7. The composition of claim 1 further comprising one or more polymerization inhibitors.
8. The composition of claim 1 further comprising one or more dispersants.
- 15 9. The composition of claim 1 further comprising one or more polymerization inhibitors and one or more dispersants.
10. The composition of claim 1 further comprising one or more solvents.

11. A method of preventing fouling in a (meth)acrylic acid process comprising adding to the process stream an effective antifouling amount of one or more aminoalkyl imidazolines of formula (I)



(I)

or one or more alkyl-substituted succinimides of formula (II)



(II)

or a mixture thereof wherein n is an integer of 1 to about 9; m is an integer of 1 to about 10; R and R' are C₁-C₆ alkylene; R₁, R₂, R₃ and R₅ are independently selected from C₁-C₃₀ alkyl, alkenyl, aryl, alkylaryl, arylalkyl, aminoalkyl, and aminoaryl; and R₄ is selected from hydrogen, (CH₂)₂COOH, CH₂CH(CH₃)COOH, imidazoline, alkyl and alkylaryl.

12. The method of claim 11 wherein the aminoalkyl imidazolines or alkyl-substituted succinimides are added to the process at a dosage of about 1 to about 10,000 ppm.

13. The method of claim 11 wherein the aminoalkyl imidazolines or alkyl-substituted succinimides are added to the process at a dosage of about 10 to about 1000 ppm.

14. The method of claim 11 wherein the aminoalkyl imidazolines or alkyl-substituted succinimides are added to the process at a dosage of about 30 to about 300 ppm.

15. The method of claim 11 wherein the aminoalkyl imidazolines or alkyl-substituted succinimides are added continuously.

5 16. The method of claim 11 wherein the aminoalkyl imidazolines or alkyl-substituted succinimides are added intermittently.

17. The method of claim 11 wherein the (meth)acrylic acid process is selected from (meth)acrylic acid manufacturing processes, (meth)acrylic acid esterification processes, acrolein
10 manufacturing processes and acrylonitrile manufacturing processes.